

MODEL GOC-5 CHARGE AMPLIFIER/VOLTAGE CONTROLLED OSCILLATOR

SPECIFICATION SHEET



The DCS Model GOC-5 Charge Amplifier/Voltage Controlled Oscillator has been specifically designed to signal condition piezoelectric transducer output signals, and either output a voltage for direct recording or output a Frequency Modulated wave for data transmission and/or magnetic tape recording purposes. The DCS Model GOC-5 charge amplifier output signal is proportional to the charge accumulated by the piezoelectric transducer's series source capacitance; hence, the output is proportional to the physical stimulus which is impressed upon the piezoelectric transducer. A compact DCS Model SGA-4 Galvanometer Amplifier can be employed to drive a high frequency oscillograph galvanometer from the charge amplifier output.

By means of the appropriate DCS Model GOC-5/F plug-in tuning units, the FM output center frequency and bandwidth (deviation) of several data channels can be chosen such that many can be transmitted to a Data Central location by a single coaxial cable or recorded on a single magnetic tape recorder track. DCS Model GSA-3 Line Drive Amplifiers provide low matched impedance, high level drive sources for cables and wide band tape recorders.

Standard DCS Module Housings provide all power supply, cooling and interconnections required by DCS UNIDAP data system components. Only 3½ inches of vertical space in a standard 19 inch equipment rack is required for one DCS Model GMA Module Housing, which in turn can accommodate up to 14 DCS Model GOC-5 Charge Amplifier/Voltage Controlled Oscillator units.

Input signal sources are not restricted to capacitive devices, and the DCS Model GOC-5 Charge Amplifier performance is not degraded when used with leaky transducers or cables. When used with resistive sources, the amplifier becomes an integrator.

PERFORMANCE SPECIFICATIONS

INPUT SENSITIVITY:

From 10 picocoulombs to 30,000 picocoulombs, full scale:

RANGE SELECTOR (pcmb, full scale, calibrated)	SENSITIVITY CONTROL (pcmb, nominal)	
	maximum	minimum
30	10	100
100	30	300
300	100	1000
1000	300	3000
3000	1000	10,000
10,000	3000	30,000

INPUT CONNECTION:

Single-ended with one side connected to analog ground.

CABLE INTERCONNECTIONS:

From 300 feet (30 pcmb range) to 30,000 feet (10,000 pcmb range) of 30 pf/foot low noise coaxial cable may be used with negligible effect on channel sensitivity or frequency response.

NOISE (REFERRED TO INPUT):

Typically 0.02 pcmb RMS, plus 0.01 pcmb RMS for each 10% increment of the maximum Interconnecting Cable Length; microphonic and shield leakage components excluded.

PERFORMANCE SPECIFICATIONS (continued)

OVERLOAD RECOVERY:

Instantaneous with inputs of up to 20 times full scale and less than one millisecond duration.

CENTER FREQUENCIES AND DEVIATIONS:

GOC-5/F Frequency Units are available for operation at center frequencies from 400 Hz to 1.5 MHz with deviation ratios from $\pm 3\%$ to $\pm 40\%$.

INTELLIGENCE FREQUENCY RESPONSE:

Down less than 3 db at 0.2 Hz and 100 kHz, with 10,000 pf of input shunt capacitance. With 1 ufd of input shunt capacitance, the response is down less than 3 db at 10 kHz.

DEVIATION LINEARITY:

The unit is linear to within $\pm 0.1\%$ of bandwidth for full deviation input.

SUBCARRIER FREQUENCY DRIFT:

Less than $\pm 0.5\%$ of bandwidth for 12 hours with a $\pm 2^\circ\text{C}$ temperature change.

DEVIATION LIMITING:

Internal limiting prevents the output subcarrier from deviating more than 20% of bandwidth beyond upper or lower bandedge.

LINE STABILITY:

In combination with the GMA-3 power supplies, the output frequency changes less than 0.1% of bandwidth for a 10% change in line voltage. Deviation sensitivity changes less than 1% for a 10% line voltage change.

CALIBRATION ACCURACY:

The optional automatic calibration system sets the ZERO pot for output subcarrier center frequency $\pm 0.1\%$. The system also sets the SENSITIVITY pot for full bandwidth deviation $\pm 1\%$, with the peak-to-peak input charge indicated by the setting of the FULL SCALE PCMB selector switch. The calibration includes the effects of input shunt capacity.

FM OUTPUT:

Nominally 400 mv rms from a 500 ohm source impedance.

SUBCARRIER DISTORTION:

Less than 0.5% of the fundamental, for any harmonic. Intelligence components are less than 0.1%.

CHARGE AMPLIFIER OUTPUT:

2 volts peak-to-peak. Source impedance 50 ohms, nominal.

FRONT PANEL CONTROLS AND TEST POINTS

SENSITIVITY RANGE SWITCH:

Selects nominal input charge for full deviation. Six positions provided: 30, 100, 300, 1,000, 3,000, 10,000 FULL SCALE PCMB.

SENSITIVITY CONTROL:

Operates as a 10:1 adjustment of the sensitivity in conjunction with the Range Switch.

ZERO CONTROL:

Adjusts output center frequency over a 10% range.

CHARGE OUTPUT MONITOR JACK:

Provides an analog output voltage proportional to the input charge.

FM OUTPUT MONITOR JACK:

Allows observation of the unfiltered (square wave) subcarrier.

INSTALLATION CHARACTERISTICS

POWER REQUIREMENTS:

All voltages supplied by GMA-3 UNIDAP Module Assembly.

MOUNTING:

Mounts in one module space of GMA-3.

DIMENSIONS:

1.14" wide x 3.29" high x 10.38" long.

WEIGHT:

17 ounces.

CONNECTORS:

GOC-5 is compatible to GMA-3 UNIDAP Module Assembly through Elco and coaxial connectors.

COOLING:

GMA-3 provides cooling through GOC-5 by inherent design.

COLOR:

Aluminum finish. Lettering on front panel is black.

ORDERING INFORMATION

SPECIFY:

UNIDAP Charge Controlled Oscillator, DCS Model GOC-5.

Plug-in Frequency Determining Unit, DCS Model GOC-5/F, Center Frequency and Frequency Deviation.

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